Eight storms were identified as having occurred in 1877. Tracks for these storms are presented in Fig. 1.

Storm 1, 1877 (Aug. 1-4).

The following information was found in connection with this storm: 1) Aug. 2-4, 1877 storm, Florida, Nova Scotia (Tannehill, 1938). 2) Florida, Aug. 2, 1877. No additional details given (Dunn and Miller, 1960). 3) New Haven, Connecticut, Aug. 21. Particulars have been received here of the foundering of the schooner "Vanname" (from Baracoa, Cuba, Jul. 17 for New York) at lat. 31 40 N., long. 74 30 W. on Aug. 3. A squall struck her on that day and no effort could have saved her from sinking. Three persons died and seven survivors passed a horrible night on some pieces of scantling which were covered by water and surrounded by sharks. The schooner "Minnie Reppelier" picked up the survivors (The New York Times, Aug. 22, 1877, p.1, col.6). 4) Winds along the coast from Florida to New York were from the N.E. and had backed to N.W. In the afternoon of Aug. 4, pressure was lowest in Nova Scotia (Monthly Weather Review, Aug. 1877).

Based on the information above, the author of this study proposed some modification of the timing shown along the track for this storm which is displayed in Neumann et al. (1993). The new 7 A.M. estimated positions along the track were as follows: Aug. 2, 28.0 degrees N., 77.0 degrees W.; Aug. 3, 31.5 degrees N., 76.3 degrees W.; Aug. 4, 39.5 degrees N., 69.5 degrees W. Positions for Aug. 2 and Aug. 3 were based, primarily, on item 3); the position for Aug. 4 was based on item 4). The position shown by Neumann et al. (1993) for 7 A.M. Aug. 1 was kept unchanged and the new positions along the track are shown in Fig. 1. The confidence the author of this study has in his estimated position for 7 A.M. Aug. 2 is rather low because items 1) and 2) suggest that the storm might have been significantly closer to Florida on that day.

Storm 2, 1877 (Sept. 14-21).

The following information was found in relation to this storm: 1) Steady fall of pressure occurred in the Gulf of Mexico from 11 P.M. Sept. 12 to Sept. 15 (Monthly Weather Review, Sept. 1877). 2) Indianola, Sept. 17, maximum wind: N. 72 mph. Lowest pressure: 29.62 inches at 4 A.M. Tide: 10.5 feet (Monthly Weather Review, Sept. 1877). 3) Houston, Sept. 17. Severe storm in Texas. A storm similar to that of Sept. 1875 struck Galveston in an early hour this morning, prostrating the telegraph wires and covering the bridges with water. The wind velocity was 35-40 mph all day. At Indianola, the wind reached 52 mph (The New York Times, Sept. 18, 1877, p.1, col.6). Author's note: The Indianola wind reported in this item is believed to be less reliable than the one in item 1). 4) Some Galveston observations: Sept. 17, 7 A.M., barometer 29.60 inches, wind N.E. 27 mph, light rain; noon, barometer 29.49 inches, wind N.E. 41 mph, light rain; 7 P.M., barometer 29.57 inches, wind N.N.E. 48 mph, threatening; midnight (Sept. 17-18), barometer 29.69

inches, wind N. 41 mph, threatening; 6 A.M. (Sept. 18), barometer 29.77 inches, wind N. 34 mph, cloudy. At 11 P.M. Sept. 17 the lowest pressure was probably located 100 miles towards the E.S.E. of Galveston (Monthly Weather Review, Sept. 1877). 5) Steamship "State of Texas", Sept. 17, lat. 27 50 N., long. 89 56 W., fresh S.W. gales and heavy sea. Sept. 18, 2 A.M., 360 miles from Galveston, gales. Sept. 18, noon, lat. 27 53 N., long. 91 10 W., heavy S.W. gales and seas. 4 P.M., wind hauled to N. Sept. 19, lowest pressure 29.65 inches, 160 miles S.E. of Galveston (Monthly Weather Review, Sept. 1877). Author's note: The lowest pressure reported by the "State of Texas" seems to be in error. 6) New Orleans. Lowest pressure: 29.40 inches at 7 P.M. Sept. 18. Maximum wind: N.E. 39 mph on Sept. 19 (Monthly Weather Review, Sept. 1877). 7) Washington, Sept. 19, 1 A.M. A severe cyclone is now south of the East Gulf States attended by heavy gales and rain (The New York Times, Sept. 20, 1877, p.5, col.5). 8) Mobile. Lowest pressure: 29.45 inches at 7 A.M. Sept. 19. Maximum wind: 35 mph at 9:15 A.M. Sept. 19 (Monthly Weather Review, Sept. 1877). 9) Washington , Sept. 19. A severe cyclone has been in the Gulf of Mexico since Sunday (Sept. 16). It has been attained by very high winds and heavy rains. It is now central near Mobile but diminishing in intensity. It is now moving slowly to the north of east (The New York Times, Sept. 20, 1877, p.5, col.5). 10) Montgomery, Al., Sept. 20. The Warrior River has risen 60 feet and is still rising rapidly. The entire river country is submerged. It has been raining since Tuesday, Sept. 18 (The New York Times, Sept. 21, 1877, p.1, col.6). 11) Washington, Sept. 20. The cyclone which since Sunday (Sept. 16) has been so severely felt in the Gulf States has slowly moved towards the eastward and is now central in southern Georgia. The barometer has been rising steadily at the center of the depression and the storm has diminished very much in severity (The New York Times, Sept. 21, 1877, p.1, col.6). 12) Map showing positions for the storm. Morning positions were (approximately): Sept. 16, 27 degrees N., 96 degrees W.; Sept. 17, 28.5 degrees N., 95 degrees W.; Sept. 18, 29 degrees N., 92 degrees W.; Sept. 19, 30 degrees N., 90 degrees W.; Sept. 20, 31.5 degrees N., 85 degrees W.; Sept. 21, 31 degrees N., 80.5 degrees W. (Monthly Weather Review, Sept. 1877). 13) Ship "Saratoga" left Savannah on Sept. 20. Had N.E. gales on Sept. 20-21, going to Baltimore (Monthly Weather Review, Sept. 1877).

Slight adjustments were proposed along the track for this storm which is displayed in Neumann et al. (1993). The following adjustments for 7 A.M. positions were made: Sept. 17, 28.5 degrees N., 94.5 degrees W.; Sept. 18, 29.0 degrees N., 92.0 degrees W.; Sept. 19, 30.0 degrees N., 88.0 degrees W.; Sept. 20, 31.0 degrees N., 83.7 degrees W.; Sept. 21, 31.3 degrees N., 78.7 degrees W. The adjustments were based on item 4) for Sept. 17, item 5) for Sept. 18, items 8) and 9) for Sept. 19, item 11) for Sept. 20 and item 13) for Sept. 21. The track prepared by the author of this paper, which is shown in Fig.1, took into account the above mentioned adjustments and kept unchanged the 7 A.M. positions for Sept. 14-16 in Neumann et al. (1993).

Although no sustained winds of hurricane intensity were indicated in the items above, the author of this study believes

that the storm was at least a weak hurricane on the basis of a central pressure below 29.40 inches which can be inferred from item 6) and the term "severe cyclone" used in items 7) and 9).

Storm 3, 1877 (Sept. 16-22).

The following information was found about this storm: 1) Brig "Harlcy John". Sept. 17, lat. 30 19 N., long. 56 45 W., hurricane from E. veering to W. , with terrific sea, lasting 24 hours (Monthly Weather Review, Sept. 1877). 2) Sept. 18 and 19, lat. 26 N., long. 64 30 W., hurricane from S.W. (Monthly Weather Review, Sept. 1877). 3) Brig "Woodcock". At Halifax, Sept. 23, from Inagua. Sept. 20, northern edge of the Gulf Stream, severe E.N.E. gale, lasting 24 hours (Monthly Weather Review, Sept. 1877). 4) Sept. 20, at lat. 33 N., long. 50 W., heavy S.S.W. gale lasting 24 hours (Monthly Weather Review, Sept. 1877). Author's note: The longitude seems to be in error. 5) Sept. 21, N.W. Shoals off Massachusetts, northerly gale (Monthly Weather Review, Sept. 1877). 6) Sept. 21, off Whitehaven, Nova Scotia, gale (Monthly Weather Review, Sept. 1877). 7) St. Paul Island, C.B., perfect hurricane lasting 15 hours (Monthly Weather Review, Sept. 1877). 8) Halifax, Sept. 23. The steamer "Alhambra" arrived this morning from Montreal, via Charlottetown. She experienced a severe storm yesterday (Sept. 22). At Pictou the gale commenced Friday evening (Sept. 21) and continued all day yesterday. At Canso, the gale continued from Friday evening to this morning. The gale was the heaviest experienced at Canso for years (The New York Times, Sept.24, 1877, p.1, col.4). 9) Washington, Sept. 23, 1 A.M. The cyclone is passing off the coast of Nova Scotia (The New York Times, Sept. 23, 1877, p.1, col.3). 10) Map showing morning positions for the storm near 37.5 degrees N., 65 degrees W. on Sept. 21 and near 45 degrees N., 59.5 degrees W. on Sept. 22 (Monthly Weather Review).

Some adjustments were made along the track which is shown in Neumann et al. (1993(). Based on information contained in the above items, the author of this study estimated the following 7 A.M. positions: Sept. 17, 29.5 degrees N., 56.5 degrees W.; Sept. 18, 31.7 degrees N., 59.3 degrees W.; Sept. 19, 34.0 degrees N., 62.0 degrees W.; Sept. 20, 36.0 N., 64.0 W.; Sept. 21, 38.7 degrees N., 64.0 degrees W.; Sept. 22, 45.3 degrees N., 59.5 degrees W. After having kept unchanged the 7 A.M. Sept. 16 position shown in Neumann et al. (1993), the author of this study used his above mentioned estimates to produce the storm track which is displayed in Fig. 1.

Although the track for this storm was started in the vicinity of 27.0 degrees N., 53.0 degrees W. on Sept. 16, the storm is likely to have formed at a lower latitude and to have been the same hurricane the steamer "Antonio Lopez" met on Sept. 11-12, before arriving in Puerto Rico (Vines, 1877). However, it would not be possible to extend the track backwards in time from Sept. 16 because not even a rough location of the steamer-hurricane encounter was given in Vines (1877).

Based on information contained in several items, particularly in items 1), 7) and 8), this storm attained hurricane intensity.

Storm 4, 1977 (Sept. 21- Oct. 5).

Quite abundant information was found in relation to this storm: 1) Sept. 21, a cyclone was reported at St. Vincent and Grenada (Monthly Weather Review, Sept. 1877). 2) In reference to the hurricane which was announced from Barbados, St. Vincent and Grenada on Sept. 21, La Voz de Cuba published on Sept. 24 a letter of mine indicating that "evidently we are in the middle of the anticyclone which is produced by the hurricane that is approaching us" (Vines, 1877). 3) Washington, Sept. 23, 1 A.M. A storm is reported in the Windward Islands (The New York Times, Sept. 23, 1877, p.1, col.3). 4) Kingston, Jamaica, Oct. 4. A severe hurricane swept over Grenada on Sept. 22, blowing down trees, injuring roofs, and damaging also the telegraph lines. Weather became threatening at Barbados on Sept. 21-22. Weather became extremely threatening at St. Vincent on Sept. 22, but after a hard blow and some heavy rain, the storm passed off without doing severe injury (The New York Times, Oct. 13, 1877, p.5, col.1 and 2). 5) The U.S. steamer "Floric" experienced a hurricane between Curacao and Puerto Rico on Sept. 22 and 23 (Monthly Weather Review, Sept. 1877). 6) Hurricane at Curacao. Sept. 23, 5 A.M., tremendous sea running, wind N., increasing to a hurricane. Pressure continued to fall until 11 A.M. when it started rising, the wind changing to E. At 2 P.M. the wind changed to S.E. From The Curacao Courant (data taken by a private person): 5 A.M., barometer 29.70 inches; 9 A.M., barometer 29.60 inches; 10:30 and 11 A.M., 29.45 inches; 11:45 A.M., 29.50 inches. A reading of 29.20 inches was reported by a small sailing vessel some distance S. of Curacao (Garriott, 1900). 7) Hurricane at Curacao. Mr. M.A. Cameron, Lloyd's agent and Consul for Belgium, Peru and Greece in a private letter dated on Oct. 8 said: "There is a heavy storm going on as I write. A hurricane occurred on Sept. 23 and destroyed half the town. The sea wave washed in and swept all the houses before it. The destruction to property amounts to 3,000,000 pounds; loss of live about 20" (The Times, London, Oct. 26, 1877, p.10, col.7). 8) The State Department received from the American Consul at Curacao an account of the hurricane which swept that island on Sept. 23. In the city, many of the most solid structures were crushed as if they had been things of paper and many persons were buried in their ruins. The American schooner "Roswell" was driven ashore. The American brig "Thetis" arrived in a damaged condition three days after the hurricane. The English brig "Curacao" was driven to Aruba, where she is now dismasted. The Dutch man-of-war "Cornelius Dirk" was severely damaged and threw several of the guns overboard (The New York Times, Oct. 30, 1877, p.1, col.4). 9) Washington, Sept. 24. On Sept. 21 a storm was reported in the Windward Islands. This evening a telegram from Key West stated that the hurricane passed Puerto Rico at 12 midday. The vortex was 250 miles S.; direction W.N.W., velocity 10 to 12 mph. The observer at Kingston, Jamaica, stated that a storm is apprehended. The observer at Santiago de Cuba recorded a fall of one tenth of an inch in the barometer (The New York Times, Sept. 25, 1877, p.5, col.2). 10) Kingston, Jamaica, Oct. 4. A cyclone was feared on Sept. 25 and 26, but we happily escaped. However, vessels coming from the west of here have arrived with damage. One was

nearly lost altogether (The New York Times, Oct. 13, 1877, p.5, col.1 and 2). 11) Steamship "Cleopatra" brings intelligence that brig "Herald" (from Montego Bay to New York) was driven ashore at Rocky Point, S. side of Jamaica, entrance of Milky River anchorage, during the hurricane of Sept. 27 (The New York Times, Oct. 9, 1877, p.8, col.7). Author's note: The "Herald" was driven ashore by the heavy seas generated by the hurricane rather than by the hurricane itself, which center was about 300 miles from Jamaica on Sept. 27. 12) On Sept. 27 and 28, the schooner "Alice Vane" at Hog Island, on the coast of Honduras, experienced a hurricane (Monthly Weather Review, Oct. 1877). 13) Schr. "Wielem Fisher", off Cape San Antonio, Sept. 28, with wind S.E. The schooner continued within the hurricane area and completely on the power of the storm until Oct. 4, when it got stranded on Anclote Key, lat. 28 N., on the coast of Florida (Monthly Weather Review, Oct. 1877). 14) From a paragraph written by Vines at Havana on Sept. 28: "The anticyclone is moving towards the north of us while the hurricane is passing to our south" (Vines, 1877). 15) The cyclone of late Sept. 1877 only affected a small portion of Pinar del Rio province in western Cuba (Martinez-Fortun, 1942). 16) Sept. 29- Oct. 10 (it should read Oct. 1). The cyclone which passed S. of Pinar del Rio province and over the Yucatan Channel was felt quite strongly over the western portion of that province. Some lives were lost and some damage was caused by the hurricane winds and flooding (Sarasola, 1928). Author's note: Actually taken from the catalog of Cuban hurricanes by M. Gutierrez-Lanza, which is included in Sarasola (1928). 17) Steamship "San Antonio", 200 miles S. of New Orleans. Sept. 29 reported a N.E. hurricane in the evening. In the evening of Sept. 30, it veered to E. but during the whole Oct. 1 it blew again from N.E. Oct. 2, 3 A.M., about 150 miles S. of New Orleans, the wind backed to N.W. Minimum pressure was 29.15 inches at 5 A.M. Oct. 2 (Monthly Weather Review, Oct. 1877). Author's note: The second position given by the "San Antonio" is in error, since the hurricane was about 200 miles to the S.E. of New Orleans at that time. 18) Steamer "S.B. Sounder". Sept. 30, about 20 miles N. of Dry Tortugas, barometer falling during the day, apparently in the northern sector of a cyclone (Monthly Weather Review, Oct. 1877). 19) Schr. "Sarah Hall". Sept. 30, noon, lat. 27 37 N., long. 84 17 W.; 6 P.M., hurricane commencing, wind E.N.E. with heavy rain until 4 A.M. Oct. 1 when it moderated. Noon, Oct. 1, lat. 27 32 N., long. 84 03 W. At 5 P.M. terrific hurricane from S. lasting until noon Oct. 3, lat. 29 22 N., long. 85 14 W. (Monthly Weather Review, Oct. 1877). 20) Steamship "Cochrane". Oct. 2 to 4, between Edmont Key and Anclote Key, heavy S.W. cyclone, lowest barometer 29.68 inches (Monthly Weather Review, Oct. 1877). 21) Schr. "Georgietta". Cyclone on Oct. 1 off Edmont Key Light, lat. 26 30 N., long. 84 W., wind E.N.E. gradually veering to W.S.W., blowing heavily until midnight of Oct. 3 (Monthly Weather Review, Oct. 1877). 22) The vortex of the storm struck the coast near St. Marks at 11 P.M. Oct. 2, showing slow progress. At St. Marks, the wind reached 66 mph at 5:15 A.M. Oct. 3 and the tide was 12 ft high; lowest barometer was 29.17 inches at 6:15 A.M.; wind S.E. gradually veering to S.W. High water was reported at Jacksonville on Oct. 2 and the barometer at Augusta was 29.35 inches at 11 A.M. Oct. 3 (Garriott, 1900).

Author's note: The barometer of 29.35 inches at Augusta, Ga., at 11 A.M. Oct. 3 is probably in error. 23) Washington, Oct. 3, 1 A.M. A cyclone attained by high winds and heavy rains is central in the Eastern Gulf States (The New York Times, Oct. 3, 1877, p.5, col.3). 24) Washington, Oct. 4, 1 A.M. For the South Atlantic States, falling barometer in advance of the cyclone central near Augusta, Georgia (The New York Times, Oct. 4, 1877, p.5, col.6). 25) The storm is reported to have blown terrific in the vicinity of Albemarle Sound (Monthly Weather Review, Oct. 1877). 26) Bark "Aretaras", off Delaware Breakwater, Oct. 4, S.E. gale, veering to N.N.W. hurricane at 8 P.M. (Monthly Weather Review, Oct. 1877). 27) Lewis, Delaware, Oct. 5. The storm of last night was the heaviest and most destructive in many years. Ten vessels foundered at their moorings (The New York Times, Oct. 6, 1877, p.1, col.7). 28) Chester, Pennsylvania, Oct. 5. Last night storm did a great deal of damage in the vicinity of this place (The New York Times, Oct. 6, 1877, p.1, col.7). 29) A raging S.E. gale blew over the New York area. The wind blew at first from S.E. but increased in violence until 8:30 P.M. (Oct. 4) when it had risen to a gale. The wind "veered" from S.E. to N. just before 11 P.M., bringing a sudden change in temperature and soon after a reduction in the velocity of the gale. The wind reached its maximum velocity of 36 mph at 8:30 P.M. It changed to N. afterwards and reached 26 mph at 10:45 P.M. Rainfall started to fall at 11:45 A.M. with the wind from S.E. 20 mph. Up to 4:47 P.M., rainfall was 0.70 inches and, from 4:47 P.M. to 10:45 P.M., rainfall was 3.95 inches (The New York Times, Oct. 5, 1877, p.2, col.7). 30) Washington, Oct. 5, 1 A.M. The lowest pressure is in New England where the barometer is falling rapidly (The New York Times, Oct. 5, p.5, col.6). 31) Fire Island, Long Island, N.Y., Oct. 5. During gale which prevailed all night, "veering" from S. to E. and N., three fishing sloops were driven ashore near the telegraph office and several bathing houses, sheds and roofs were blown down (The New York Times, Oct. 6, 1877, p.1, col.7). 32) Newport, R.I., Oct. 5, The storm was very severe in this vicinity and the wind blows a gale this morning (The New York Times, Oct. 6, 1877, p.1, col.7). 33) Vineyard Haven, Oct. 5. A violent gale from the N. prevails (The New York Times, Oct. 6, 1877, p.1, col.7). 34) Provincetown, Ma., Oct. 5. A heavy N.W. squall struck here at 7:30 A.M. and continued blowing heavily (The New York Times, Oct. 6, 1877, p.1, col.7). 35) Biddeford, Me., Oct. 5. The wind is blowing a gale from N.N.W. Over 175 vessels are seeking shelter at the Pool (The New York Times, Oct. 6, 1877, p.1, col.7). 36) On the morning of Oct. 5, the storm probably was 2 degrees S.E. of Cape Cod and at midnight 4 degrees S.E. of Cape Breton (Monthly Weather Review, Oct. 1877). Author's note: According to wind reports from Massachusetts and Maine in items 33) through 35), the morning position 2 degrees S.E. of Cape Cod is erroneous. 37) Map showing a track for the storm starting near 12 degrees N., 65 degrees W. at 4:35 P.M. Sept. 22 and ending off Cape Cod on Oct. 5 (Monthly Weather Review, Oct. 1877).

Based on the information above, the author of this study proposed some slight modifications along the track for this storm which is shown in Neumann et al. (1993). For the period Sept. 21-24, new 7 A.M. positions were estimated by the author as follows:

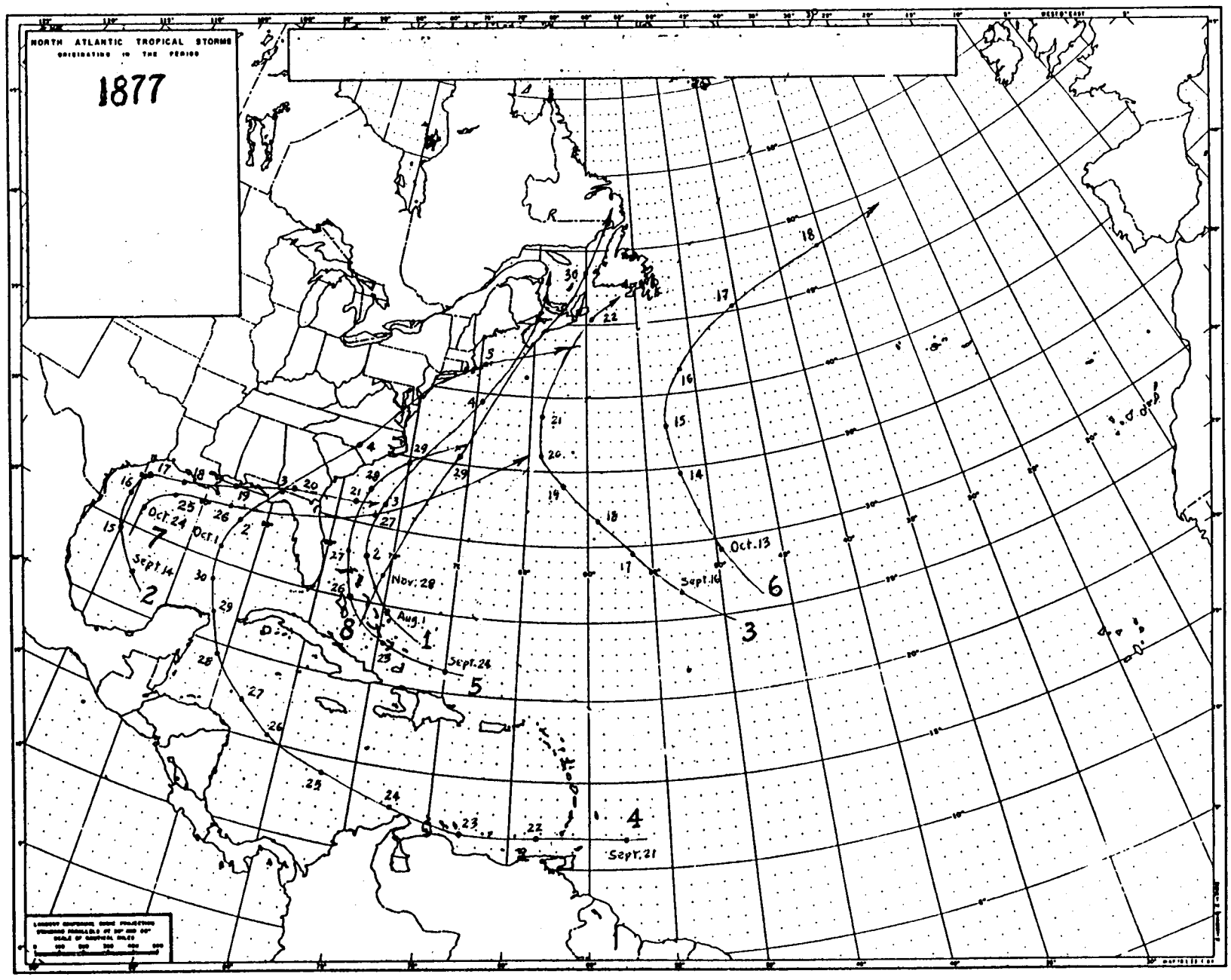
NORTH ATLANTIC TROPICAL STORMS
ORIGINATING IN THE PERIOD
1877
Oct. 24
Oct. 1
Sept. 14
Nov. 28
Aug. 1
Sept. 24
Sept. 16
Oct. 13
Sept. 21
1
2
3
4
5
6
7
8

Fig. 1

Sept. 21, 11.7 degrees N., 57.7 degrees W.; Sept 22, 11.7 degrees N., 63.3 degrees W.; Sept. 23, 11.7 degrees N, 68.0 degrees W.; Sept. 24, 12.7 degrees N., 72.5 degrees W. Items 4) and 6) were most useful in supporting the position changes proposed over that period. In addition, the track in Neumann et al. (1993) was slightly adjusted to the north over the period Oct. 4-5, after having determined a new 7 A.M. Oct. 5 position near 42.0 degrees N., 69.5 degrees W. The entire adjustment of the track over the Oct. 4-5 period took into account information contained in items 28) through 35). The track prepared by the author of this study is displayed in Fig. 1.

Barometer readings of 29.20 inches reported by a sailing vessel S. of Curacao (item 9), of 29.15 inches reported by the "San Antonio" (item 17) and of 29.17 inches at St. Marks (item 22) allowed one to infer that this storm attained hurricane intensity.

Storm 5, 1877 (Sept. 24-29).

The following information was found in relation to this storm: 1) On Sept. 24 observers in Jamaica and Santiago de Cuba reported every appearance of a hurricane at a distance to the N.E. (Monthly Weather Review, Sept. 1877). 2) On Sept. 27, the cyclone was east of Florida. At 7:35 A.M. Sept. 28, it was S.E. of Wilmington. It was severely felt from Cape Lookout to Cape Henry (Monthly Weather Review, Sept. 1877). 3) Ship "Magnolia", from Savannah for New York, foundered off Cape Hatteras on Sunday (Sept. 30). The ship left Savannah at 12 M Sept. 27. Sept. 28 took heavy squalls from N.N.W. Sept. 29, moderate N.E. wind; at 3 P.M., increasing N.E. wind and squally; took soundings on Hatteras Shoals. Sept. 30 at 4 A.M. discovered the vessel was leaking. The crew of 43 and 3 passengers were rescued by the bark "Stralsund" (The New York Times, Oct. 4, 1877, p.8, col.6). 4) From a letter written by Capt. Oehlberg of the bark "Stralsund" on Oct. 3. Passed Cape Henry on Sept. 27 and experienced very boisterous weather with continued gales from E. On Sept. 28 wind veered around to N.E enabling the vessel to get clear of the land. On Sept 30 when 120 miles off Cape Henry fell in with the "Magnolia" in a sinking condition. Noticed 5 boats with crew and passengers leaving and although a tremendous high sea was running at the time succeeded in taking them safely on board (The New York Times, Oct. 7, 1877, p.4, col.7). 5) Norfolk, Sept. 30. The steamer "Gulf Stream", from Charleston for New York, put here for coal after a stormy passage of 4 days. The captain reported fearful weather on the coast, heavy N.E. gales and chopping sea. No wrecks were reported (The New York, Oct. 1, 1877, p.1, col.6). 6) Map showing the storm near 28.5 degrees N., 79 degrees W. at 4:35 P.M. Sept. 27, near 31 degrees N., 78.5 degrees W. in the morning of Sept. 28 and near 34 degrees N., 75.5 degrees W. in the morning of Sept. 29 (Monthly Weather Review, Sept. 1877).

Based on information contained in items 2) and 3), the author of this study proposed an adjustment to 32.3 degrees N., 77.7 degrees W. of the 7 A.M. Sept. 28 position, roughly at 31 degrees N., 78 degrees W., given in Neumann et al. (1993). The rest of the track displayed in that publication appeared to be quite reasonable in the light of the remaining items above. Therefore, after having

applied the proposed adjustment for the 7 A.M. Sept. 28 position, the author of this study has reproduced the track in Neumann et al. (1993) and displayed it in Fig. 1. It should be mentioned, however, that the author of this study is skeptical about the portion of the track over the period Sept. 24-26, in spite that some support for it is provided by the information contained in item 1). One reason for his skepticism is that it is extremely unusual to have two storms moving along almost exactly parallel courses keeping a distance of 550-600 miles from one to another over a period of three days, and that this would be the case for this particular storm because a second one (Storm 4, 1877) was simultaneously moving over the Caribbean Sea under the above mentioned conditions. A second reason for the author's skepticism is that it is hard to believe that the circulation of the northernmost storm (had it existed) did not seem to have had an effect on the steering of the storm to the south (Storm 4, 1877), causing its motion to slow down; according to Fig. 1, the forward motion of the latter storm remained essentially unchanged. The author of this study would have felt more comfortable if he had started his track for Storm 5, 1877 on Sept. 27 near the northwestern Bahamas but, nevertheless, the decided to retain the track for period Sept. 24-26 shown in Neumann et al. (1993) because he did not find any evidence against the existence of the storm over such a period.

It should be mentioned as a matter of curiosity that neither Tannehill (1938) nor Dunn and Miller (1960) made reference to this storm in spite of having seriously affected the coastal area between Cape Lookout and Cape Henry (item 2).

Storm 6, 1877 (Oct. 13-18).

No information that could be definitively identified with this storm was found. However, the following information could have been possibly related to the storm if some error in the dates the storm occurred were accepted: 1) Oct. 17, lat. 33 30 N., long. 50 57 W., gale (Monthly Weather Review, Oct. 1877). 2) Oct. 17, lat. 39 14 N., long. 56 08 W., hurricane (Monthly Weather Review, Oct. 1877). 3) Oct. 19, lat. 51 32 N., long. 40 36 W., gale (Monthly Weather Review, Oct. 1877). 4) Oct. 20, lat. 45 14 N., long. 39 17 W., violent storm (Monthly Weather Review, Oct. 1877). 5) Oct. 21, lat. 48 38 N., long. 34 10 W., gale (Monthly Weather Review, 1877).

The above items allowed the author of this study to produce a track (not reproduced) which spacewise does not differ greatly from a portion of the one shown in Neumann et al. (1993). However, the timing of the author's track is about two days behind the timing displayed along the track in Neumann et al. (1993). This finding, of course, brings the important question of whether the space coincidence noted for both tracks implies a) the facts that they are depicting the same storm and that the timing in Neumann et al. (1993) is erroneous or b) the existence of two successive storms moving along similar tracks with a time difference of about two days. In view that the author could only speculate about these two possibilities, he decided to accept the track for the storm shown in Neumann et al. (1993) without any modification and to reproduce it in Fig. 1.

Storm 7, 1877 (Oct. 24-27).

The following information was found in connection with this storm: 1) Near 5 inches of rain fell at Galveston during the evening of Oct. 24. Heavy rain and N. to E. winds prevailed from Indianola to Mobile on Oct. 25. Possible slight depression passed N.E. over N. Florida to N. Carolina by 11 P.M. Oct. 26. St. Marks reported a 40 mph wind in the afternoon of Oct. 26 (Monthly Weather Review, , Oct. 1877). 2) Oct. 27-29, 1877 storm. In the Atlantic, off the U.S. coast (Tannehill, 1938). 3) The "Canima" left New York for Bermuda on Oct. 25. On Oct. 27, when it was one day from its destination (Bermuda), a gale struck the steamer with unusual violence, breaking the forward steering apparatus (The New York Times, Nov. 6, 1877, p.8, col.2). 4) Map showing a track for the storm which indicates a position near 28.5 degrees N., 88 degrees W. in the morning of Oct. 26 (Monthly Weather Review, Oct. 1877).

The track for this storm shown in Neumann et al. (1993) was accepted for the period Oct. 24-26, but their position for 7 A.M. Oct. 27 over northern Florida was relocated to 30.7 degrees N., 77.0 degrees W., primarily on the basis that the time of maximum winds (40 mph) was reported to have been at St. Marks in the afternoon of Oct. 26 (item 1) when the storm passed to the south, and that the "Canima" encountered the storm towards the northwest of Bermuda, presumably late on Oct. 27 (item 3). The information provided by the "Canima" (item 3) allowed the author to extend the track to the vicinity of 36.0 degrees N., 65.0 degrees W. by the end of Oct. 27 and, by so doing, to satisfy, in part, item 2). The author's track for this storm is displayed in Fig. 1.

Storm 8, 1877 (Nov. 28-30).

The following information was found in relation to this storm: 1) This is probably the storm reported by the "Princess Beatrice" near the Leeward Islands on Nov. 23, 24 and 25. On the afternoon of Nov. 28 there was a decided fall of pressure in the South Atlantic States and this fall, together with the wind direction on the coast indicated a storm center of considerable energy near the Gulf Stream and E. of Florida. The barometer and backing of the wind along the coast indicated a track slightly E. of N. until midnight Nov. 29 when the center was located near Halifax. Next day it disappeared beyond Nova Scotia (Monthly Weather Review, Nov. 1877). 2) The wrecked war ship. Bad weather again. The work of recovering the bodies stopped (The New York Times, Nov. 29, 1877, p.1, col.7). Author's note: The war ship referred to by the newspaper was the U.S. steamer "Huron" which was totally wrecked on the North Carolina coast, about 75 miles S. of Cape Henry, during a terrible gale around 1 A.M. Nov. 24 (The New York Times, Nov. 25, 1877, p.1, col.1). There is no indication that such a gale had been of tropical origin or had acquired tropical characteristics. 3) Norfolk, Nov. 29. Wreck of the "Huron". Work suspended by rough weather. The rough weather of the past 24 hours, together with the heavy sea and furious surf, has compelled entire suspension of operations on the wreck of the "Huron" (The New York Times, Nov. 30, 1877, p.1, col.4). 4) Map showing the storm near 28 degrees N.,

75.5 degrees W. in the afternoon of Nov. 28, near 36 degrees N., 73 degrees W. in the morning of Nov. 29 and near Halifax in the night of Nov. 29 (Monthly Weather Review, Nov. 1877).

The information contained in the above items was found to support, in general, the track for this storm which is shown in Neumann et al. (1993). Therefore, the author of this study adopted that track without introducing any modification and reproduced it in Fig. 1.

Based on the characteristics of the track in Fig. 1, the author of this study believes that the alleged connection of this storm with the one reported by the "Princess Beatrice" (item 1) is doubtful.